



Innovation and Technology in Agriculture Bill 2019 (NSW)

The Hon. Elise Northcote (Goulburn) - Lead Sponsor

The Hon. Angad Singh (Ku-ring-gai) - Lead Refuter

The Hon. Jake Muller (Cessnock)

The Hon. Lachlan Hyde (Cabramatta)

Innovation and Technology in Agriculture Bill 2019

A Bill for

An Act to foster Innovation and Technology in agriculture as well as investigating and implementing emerging technologies in the industry throughout New South Wales.

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Explanatory Notes

The global population has grown from one billion in 1800 to now 7.186 billion humans inhabiting the planet¹. Agriculture covers half the Earth's entire land surface and requires more land, water and human labour than any other industry. (Global Agriculture). In the past fifty years global food production has more than doubled, keeping pace with population growth but inevitably increasing agriculture's environmental footprint. This is especially concerning considering more than half of all the world's species exist primarily in agricultural landscapes, outside protected areas. There is evidence that the productivity of many agriculture systems cannot be maintained with current management. Industrial agriculture uses 2-3 times more fertilisers and 1.5 times more pesticides for the production of one kilogram of food than it did forty years ago². Growth in production can only come through increased yields, usually through a larger dosage of chemicals, or increased area of production. Yet many regions of the world now face a shortage of land for additional cropland expansion. Widespread land degradation, soil erosion, yield losses due to climate change and changes in the proportion of non-food crops to food crops all have impacted the available cropland for food production. Meanwhile, cropland is being converted all over the world to other uses due to increasing urbanization, industrialization, energy demand and population growth and there are limitations to the amount of new land that can be taken into cultivation. Extensive land degradation, increasing resource scarcity and climate change are raising questions of whether it is possible to feed a world population of 9.1 billion by 2050.

The pathway to sustainable agriculture is long and steep and this can only be achieved by innovation and technological advances in the agriculture sector as seen in the objects present in this bill. This includes unmanned aerial vehicles (drones) which can automate and increase the productivity of farms. This also includes breeding crop varieties with greater yields. Conventional breeding, mutagenesis, genetic modification, gene editing and marker-aided selection can breed new improved crop varieties. Genetic modification allows plant breeders to produce a crop variety with specific characteristics that could not be bred using conventional breeding. With the advance in research within this field the farms within Australia may be able to improve the food production for the to meet the requirements of its growing population. Cultured meat has also been a key solution seen to reduce the environmental impact of the meat industry and free up resources for further agricultural growth. Cultured meat is 'much more efficient and environmentally-friendly' generating only 4% greenhouse gas emissions,

¹ (Dadax, 2019).

² FAO, 2019

reducing the energy needs of meat generation by up to 45%, and requiring only 2% of the land that the global meat/livestock industry does³. Through the implementation of this, we aim to foster and innovate within the agriculture sector.

Part 1 Preliminary

1 Name of Act

The Bill may be cited as the *Innovation and Technology in Agriculture Act 2019*.

2 Commencement

This act commences one seventy-three days after Royal Assent from the NSW Youth Governor on the 1 January 2020.

3 Objects

The objects for this Bill are

- 1) To create long-term solutions to reduce the brain drain in NSW through education of youth and investments in innovation.
- 2) To encourage agricultural development and research specifically in water usage, genetically modified crops and automation.
- 3) To increase robotic and technological use in agriculture state-wide.
- 4) To protect the environment in particular in concern to farming emissions pesticide use
- 5) To improve the water security within the NSW agriculture industry.

4 Definitions:

In this Act:

Brain Drain shall mean the loss of talent in Australia as most young entrepreneurs of businesses choose to move to Silicon Valley

³ Spector, 2010.

DPI shall mean Department of Primary Industry in NSW government.

Fostering shall mean encouraging the development

Genetic modification refers to the modification of the DNA of plants used in agriculture

Grant Funds shall mean non-repayable funds given by the NSW government to a recipient, often a nonprofit entity, educational institution, business or an individual.

Industry Qualifications shall mean the ability or qualification to work in a particular industry

Low emissions farming shall mean farming with the aim to decrease emissions and improve farmer livelihoods

Rural Areas shall mean areas within NSW that are not towns or cities often used for farming and agriculture.

STEM shall mean Science, Technology, Engineering and Maths.

Tax break shall mean a tax concession or advantage allowed by the government

Unmanned aerial vehicles are aircraft without a human pilot on board, also known as drones.

Part 2 Clauses

5 Addressing Brain Drain

- (1) The NSW Department of Education will oversee an ongoing committee within the New South Wales Education Standards Authority (NESA) with the aim of increasing education of agriculture and farming practices within schools by adjusting the Science and Technology syllabus:
 - a) From Stage 2 (Year 3/4) promoting agriculture and farming as a career,
 - b) Stage 3 (Year 5/6) drawing on this knowledge learning about the benefits of the career path and spending practical time on location at farming facilities,
 - c) Stage 4 (Year 7/8), students will study about Unmanned Aerial Vehicles (Drones) and the impact these have on the agriculture sector with practical hands-on education of these technologies supported through granting access to technical facilities.
 - d) Stage 5 (Year 9/10), students will draw upon this knowledge and have the opportunity to achieve industry qualifications specialising in agriculture.
- (2) The Department of Treasury will provide twelve million, five hundred thousand (12.5 million dollars) for grants provided to:

- a) Year 12 graduates to:
 - i. Relocate to rural areas to work within the agriculture industry in rural and regional areas of NSW farmland,
 - ii. Study agricultural science in universities located outside of capital cities.
- b) Private citizens or businesses/companies which have promising new technologies to improve the NSW Agriculture sector.

6 Advances in the Agriculture industry

(1) Research

- a) The NSW DPI will appoint a NSW Chief Agricultural Scientist for the continuation of research and development within the agricultural sector who will report back to the Minister for Agriculture yearly. The main goals of the individual appointment will be:
 - i. Head a search for companies that may benefit from collaboration with the NSW government.
 - ii. Consult with the Department of Health and continue to research the effect of fertilisers and pest controls have on food products.
 - iii. Consult with the NSW Office of Water on how to improve water usage in agriculture throughout the state especially the Murray Darling Basin.
 - iv. Further the development and application of robotics and automation within the agricultural sector through various field testing.
 - v. Investigate how to prevent and mitigate the effects of future changes in the environment to the agriculture industry caused by climate change.
- b) Increase the funding of agricultural research and development in the DPI by 25% specifically to facilitate the goals of the Chief Agricultural Scientist.
- c) Create a Council for the Use of Genetically Modified Crops made up of scientists and industry specialists from the DPI, whose goal will be to:
 - i. Initiate an investigation into the feasibility of further genetically modified crops usage, with respect to
 - Increasing productivity of medium to large scale farms
 - Safety for human and animal population

- Effect on biodiversity and ecosystems
 - Containment
- ii. Research the demand of genetically modified crops within the market.
 - iii. Report back with an assessment in five years.
 - iv. After the assessment, the council will then consult the DPI for rapid implementation of new GMO technology within agriculture.

(2) Technology

- a) Allocate 1% of the Department of Primary Industries (DPI) budget to
 - i. Conduct a full assessment on the technology available for small to medium farming businesses, including advanced methods of measurement.
 - ii. After such assessment, introduce a board collaborating with the Chief Agricultural Scientist to oversee the distribution of monies for the statewide purchase and upgrade of automation and other technology equipment for small to medium business farms.
- b) Collaborate with NBNco to ensure internet connectivity is up to global standards in rural and regional areas for computer systems within private properties and small to medium farms.

7 Environment

(1) Low Emissions Farming

The Department of Treasury will provide tax breaks for both small and large farming business who reduce their carbon dioxide emissions by twenty-five percent in ten years, with increased tax breaks and other incentives for those who exceed the target.

(2) Fertilisers and Pesticides

The Department of Primary Industries will:

- a) Conduct an assessment of pesticide and fertiliser use in agriculture in NSW,
- b) Advise farmers statewide on how to reduce runoff and other environmental damages

(3) Artificial Meat

The government will correspond with corporations within NSW who wish to further the development of cultured (artificial) meat. After rigorous testing at a maximum of five years in

regards to any health impacts the product will then be facilitated onto the market with small grants if required.

8 Waterways

The Department of Primary Industry (DPI) will establish an investigatory committee to be titled the NSW Waterways Action Taskforce and Environmental Regulator (WATER) to:

- a) Produce an assessment on the waterways of New South Wales, which will:
 - i. Look into and investigate ways to improve the water usage for rural and regional areas including water for all commercial farms
 - ii. Study and investigate desalination as a solution to improve the water security of agriculture sectors, looking at areas in which to construct such facilities.
 - iii. Report back to the DPI in two years.
- b) After assessment, implement the improvements including the desalination facilities in the areas suggested.

9 Public Awareness

A high-profile campaign will take place being conducted by the Department of Primary Industry highlighting the importance and benefits of agriculture to the wider public of New South Wales. The campaign will further provide the public with information on the variety of jobs and opportunities within the industry which aid the idea of a more technologically advanced Australia, not suffering from the drain of talent.

10 Penalties

This bill and committee do not support the idea of penalties as this bill's purpose is to encourage and educate the people of NSW in the agriculture sector.

Amendments

11 Delayed introductions of GMO

Clause number	3
Existing clause wording	<p>“(1), c) Create a Council for the Use of Genetically Modified Crops made up of scientists and industry specialists from the DPI, whose goal will be to:</p> <p>i. Initiate an investigation into the feasibility of further genetically modified crops usage, with respect to</p> <ul style="list-style-type: none"> - Increasing productivity of medium to large scale farms - Safety for human and animal population - Effect on biodiversity and ecosystems - Containment <p>ii. Research the demand of genetically modified crops within the market.</p> <p>iii. Report back with an assessment in five years.</p> <p>iv. After the assessment, the council will then consult the DPI for rapid implementation of new GMO technology within agriculture.”</p>
Amendment request	Extend the research for a significant time of 20-30 years before considering the implementation of GMO's.
New clause shall now read	<p>“1,c)The Environment Protection Agency will develop a report on the use of Genetically Modified Crops to be handed down to the parliament for a potential future amendment to the bill. This report should be developed over a minimum of 20-30 years, or however long concrete evidence is produced to support the theory of safe practice within genetic modification within food production. This report would determine any long-term effects of GMO on the overall health of the environment as well as the health of humans.”</p>

12 Delayed introductions of Cultured meat

Clause number	3
Existing clause wording	“(3) Artificial Meat The government will correspond with corporations within NSW who wish to further the development of cultured (artificial) meat. After rigorous testing at a maximum of five years in regards to any health impacts the product will then be facilitated onto the market with small grants if required.”
Amendment request	Production and nsumption of cultured meat will be restricted until long-term research of over 20 years.
New clause shall now read	i.“(3) i.The wholesale production and consumption of artificial (cultured) meat, fruit and vegetables are to be restricted by prohibition until the long term effects on the health of the public can be studied by the NSW Health Department for a period of 30 years. Only after such study will further debate on the issue will be heard.”

13 Removing desalination for Water diversion

Clause number	4
Existing clause wording	<p>“The Department of Primary Industry (DPI) will establish an investigatory committee to be titled the NSW Waterways Action Taskforce and Environmental Regulator (WATER) to: Produce an assessment on the waterways of New South Wales, which will:</p> <ul style="list-style-type: none"> i. Look into and investigate ways to improve the water usage for rural and regional areas including water for all commercial farms ii. Study and investigate desalination as a solution to improve the water security of agriculture sectors, looking at areas in which to construct such facilities. iii. Report back to the DPI in two years. <p>b) After assessment, implement the improvements including the desalination facilities in the areas suggested.”</p>
Amendment request	<p>To readdress and refocus the aim and objective of the Waterways Action Taskforce and Environmental Regulator (WATER) from desalination to waterway diversion, removing 4b).</p>
New clause shall now read:	<p>“The Department of Primary Industry (DPI) will establish an investigatory committee to be titled the NSW Waterways Action Taskforce and Environmental Regulator (WATER) to: Produce an assessment on the waterways of New South Wales, which will:</p> <ul style="list-style-type: none"> i. Look into and investigate ways to improve the water usage for rural and regional areas including water for all commercial farms ii. Produce a study to investigate engineering solutions for diverting water inland regions across the state including the feasibility of the “Bradfield Scheme”. The outcome of this study will be to help improve water security while also ensuring the quality and amenity of river systems such as the Murray-Darling Basin. iii. Report back to the DPI in two years.